Plans for Production Use of Grand Challenge Software in STAR

Torre Wenaus
BNL

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Congrats and thank you!

First, congrats on a successful test in MDC1 of a software apparatus

- very well focused on the priority needs of STAR and RHIC
- of immediate use to STAR for day to day operations
- on target to meet STAR's needs for physics analysis

Thank you for building rapidly a very useful facility!

STAR MDC1 Production

Simulated data:1.7TB of 200GeV/n Au-Au HIJING (217k events)

Reconstructed DSTs: 600GB XDF files from above (168k events)

Objectivity event store: 50GB, stopped when disk space exhausted

Want to load all 600+ GB into Objectivity

- Event database files HPSS resident
- Management via GC software in STAF
- In about 2 weeks, after a schema and code update

Already the 50GB federation is migrated to HPSS (no space), so the sooner we can offer GC-managed access to CAS STAF users the better

- Applications ready or nearly ready to use the event store DB:
  - Event by event scale correlation analysis (SCA)
  - DST QA evaluation code
  - Strangeness analysis

Schema and Structure Update

Changes to database schema and code before rebuilding the federation:

- Individual container per collection in header database to minimize lock contention
- Correction to cluster header: tag objects should not be referenced
- Add event ID to cluster header
- Storage of run info, summary in collection header must be fixed; problem with BaBar inheritance in StOdbEventCollection
- Replace persistent strings to control object pollution
- New vertex table from strangeness group (reduced ev0_aux)
- Review and update of run specification and run configuration specification in DST tables
  - Specification of detector/parameter specification via configuration key

Database File Organization

Top-level metadata and tag files in $STAR_DB/stardb (sol disk)

- Event collections and headers
- Tag headers and tags

Single directory containing event data $STAR_DB/stardb/dst (disk1)

- Can live with single disk directory for the moment, but will need multi-directory capability soon (when we split event data into >1 cluster)
- Event database files correspond to reconstruction jobs with same name as XDF file

HPSS migration by moving event data files to /starreco/stardb/dst in HPSS

- **Compatible with GC?**

All DB loading so far done serially

- BaBar has seen problems in parallel loading; we need to test

Near term Use of GC Software

"Production" usage mode: independent activity at the physics analysis group level

- At the physicist level if we can get away with it (performance)

Management of the HPSS event store for STAF CAS users is the critical path item

- Retrieval by collection will be initial usage mode

Beyond that, would like to have available to users

- Query estimation and retrieval by query
- Retrieval by event list
- Logging, statistics, HPSS performance info
- Tagdb visualizer

Need direct API from TagDB to index builder, no intermediary file

- Simple 'rebuild the index' procedure

Event Store Database on Linux

Only operational platform for Objy event store at present is Sun/Solaris

No STAR Objectivity operations on Linux

- Biggest problem: BaBar/STAR database software port to Linux
  - No attempt made yet to build on Linux
  - At least some BaBar software reportedly needs egcs or 2.8.1, so we may have to wait for the next Objy/Linux version
  - Rogue Wave reportedly does compile and work but not officially supported
  - Will have a shot at building the BaBar essentials with gcc 2.7.3 and see whether encountered problems are surmountable
- If we get past that, until we get Objy version with Linux platform index overflow fixed, could build duplicate federations for Solaris and Linux

So, timescale for wanting to use GC from Linux unclear

Use of ROOT

Assumption:

- ROOT usage of event store and ROOT usage of GC software are the same problem; when we solve the former we will have solved the latter
- No specific issue for GC

ROOT+Objy not touched yet. Lower priority than getting everything operating well under STAF.

MDC2 Wish List

(Preliminary)

Multiple separately stored clusters per event

Retrieval of non-Objectivity components

- Objy Event store stores file reference, not the data itself
- We still pass an event ID and (set of) cluster ID's to be retrieved, but you recognize cluster ID's that refer to to non-Objy files
- Uses:
  - XDF fall-back for Objectivity!
  - ROOT-format components
  - Raw data retrieval

Retrieval of components from multiple COS's

Dynamic updating of index

Ability to specify (at administrator level) 'keep this data on disk'

- Ability to manage what material we keep on disk